

ENVIRONMENTAL IMPACT STATEMENT

FINAL SUPPLEMENTAL
Lake and Stream Rehabilitation Program
1989-1990



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DEPARTMENT OF ECOLOGY
ENVIRONMENTAL REVIEW

JULY
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Washington Department of Wildlife



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CURT SMITH
Director



STATE OF WASHINGTON
DEPARTMENT OF WILDLIFE

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TO ALL INTERESTED AGENCIES AND INDIVIDUALS

This final supplemental environmental impact statement (SEIS) for the Washington State Department of Wildlife's 1989-1990 Lake Rehabilitation Program has been prepared in accordance with the Washington State Environmental Policy Act of 1971 (Chapter 197-11, Washington Administrative Code).

Your interest in this document is appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "DR Mudd".

David Mudd
SEPA Responsible Official

Comments and requests for information should be addressed to:

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Fisheries Management Division
Washington Department of Wildlife
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Olympia, Washington 98504
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Authors and Principal Contributors:

This document was prepared by the Regulatory Services Program, Habitat Management Division, and various staff of Fisheries Management Division, Washington Department of Wildlife.

Location of Background Information:

SEPA Public Information Center
Washington Department of Wildlife
Habitat Management Division
600 North Capitol Way
Olympia, Washington 98504

Public Hearings or Meetings:

A public hearing and final action by the Wildlife Commission is tentatively scheduled for August 12, 1989 at the Towne Plaza Motor Inn in Yakima, Washington.

Cost to the public for this EIS: None

Date of issue of this final EIS: July 1989

SUMMARY

Washington Department of Wildlife maintains a program which uses rotenone ($C_{23}H_{22}O_6$) to eliminate all fish in a particular lake or stream prior to restocking the water with fish species selected for management. This species is usually, but not always, a variety of trout. Rotenone is dispersed into a lake or stream with boats or spray pumps at a concentration of 0.5 to 2.0 parts per million. Aircraft may be used in some cases.

The objective of this action is to improve public fishing. Populations of fish which compete with a preferred management species are eliminated to minimize competition for food and space. Rotenone has been used for lake and stream management in Washington for the past 45 years. It is used because of its effectiveness in eliminating fish, low toxicity to mammals, non-residual quality, and cost. The proposed action has taken place on many popular sport fishing lakes and a few streams throughout the state. Lake and stream rehabilitation today is almost entirely a maintenance program.

Summary of Environmental Impacts

1. Rate and distribution of lake soil sedimentation may be altered with changes in species abundance and diversity.
2. Adverse odors may be present while killed fish decompose.
3. Temporary changes in bacteria levels, turbidity, phytoplankton, and water taste/odor usually occur.
4. Algae blooms may occur. They generally last one to two months and do not recur the following year.
5. Zooplankton are almost completely eliminated. Complete recovery usually takes between two and 12 months.
6. Benthic fauna are reduced in numbers. Recovery time is usually two months.
7. Fish are completely (or nearly) eliminated. Species to be managed are usually restocked within two to six months.
8. Fish species diversity is diminished and total numbers are reduced.
9. Fishing for a selected species is enhanced.

10. Larval amphibians and some adults are killed. Adult amphibians and reptiles may be indirectly affected by temporary loss of aquatic insects and fish which are food sources.
11. Birds and mammals which depend on fish or benthic animals for food may be temporarily impacted by this program.
12. Humans in direct contact with rotenone powder may experience temporary skin, eye, and mucous membrane irritations.
13. Aesthetic qualities are temporarily affected while water is brown in color. This usually lasts a few hours to a few days. Floating or beached fish also decrease aesthetic values.
14. Increases in human activities as a result of enhanced fishing may cause erosion; air, water, and noise pollution; trampling of vegetation; or other impacts to recreation, religious, or scientific use of the area.

Summary of Alternatives

1. No action.
2. Stocking with legal-sized fish.
3. Use of different fish toxicants.
4. Partial treatment.
5. Control of water levels.
6. Netting and trapping.
7. Dams and barriers.
8. Baits.
9. Electrofishing.
10. Hook-and-line fishing.
11. Predator stocking.
12. Removing congregations of spawning fish.

* Additional information on the program, impacts, and alternatives can be found in the final programmatic environmental impact statement titled "Lake and Stream Rehabilitation Program", prepared by Department of Wildlife in July 1988.

LAKES TO BE TREATED IN 1989-1990

REGION 1, FERRY COUNTY

Ellen Lake (Sections 26, 34, 35, Township 35N, Range 36E)

Ellen Lake has a surface area of about 82.4 acres with a maximum depth of 32 feet. It is located in a coniferous forest area consisting of Douglas fir, larch, ponderosa pine, lodgepole pine, alder, and willow. Land use is primarily timber production.

Some water lilies, cattails, and rushes grow in the lake. Wildlife using Ellen Lake and the surrounding area includes waterfowl, deer, bear, beaver, and possibly elk. There is a developed public access area.

Fish species include rainbow trout and smallmouth bass. Ellen Lake is managed as a trout only water, and introduction of smallmouth bass has caused competition and decline in growth of trout. This has resulted in decreased recreation available to anglers.

Ellen Lake is proposed to be rehabilitated with 2,750 pounds of dry rotenone applied with tow sacks at a concentration of 1.0 ppm. This lake was last treated in 1951. Proposed rehabilitation would take place in the fall of 1989 when the outlet is dry. Restocking would occur in April 1990 with 22,000 fry and 10,000 legal-sized rainbow trout. Beneficial effects should last about 10 years.

REGION 1, PEND OREILLE COUNTY

Fan Lake (Sections 21, 32, Township 30N, Range 43E)

The surface area of Fan Lake is about 79 acres with a maximum depth of 74 feet. Surrounding vegetation is mixed conifer and deciduous forest. Land use in the area is approximately 13% agriculture and 85% forest/unproductive. The lake is used for fishing and swimming.

There are water lillies, cattails, bulrush, and other rooted aquatic plants growing in the water. The area provides habitat for deer, bear, waterfowl, beaver, muskrat, and various nongame species.

Fish species include cutthroat trout and green sunfish. Sunfish have reinfested the lake and compete with cutthroat causing reduced trout growth and loss of primary recreational use of the lake.

Fan Lake is proposed to be rehabilitated with 5,500 pounds of dry and 30 gallons of liquid rotenone applied with tow sacks at a concentration of 1.0 ppm. This lake was last treated in 1983. The proposed rehabilitation would take place in the fall of 1989 when the lake outlet is dry. Manual pickup and burying of dead fish will be done if necessary. Restocking with 25,000 fry and 10,000 legal-sized cutthroat trout is planned for April 1990. Beneficial effects of the treatment are expected to last six to nine years.

REGION 1, PEND OREILLE COUNTY

Sacheen Lake (Sections 24, 25, 26, 35, Township 31N, Range 43E, and Section 30, Township 31N, Range 44E)

This lake is located in the headwaters of the west branch of the Little Spokane River, and covers an area of about 320 acres with a maximum depth of 40 feet. The surrounding area is residential and forested with a small amount of agriculture. Cedar Creek Resort is located here. Sacheen Lake is used for fishing, swimming, and irrigation. There is a developed public access area.

Vegetation in the area is mostly coniferous forest with ponderosa pine, western red cedar, Douglas fir, and some willow and alder. Aquatic vegetation includes water lillies, cattails, sedges, and other rooted aquatics. This area provides habitat for waterfowl, beaver, muskrat, deer, bear, elk, and moose, as well as nongame species. There is an osprey nest located on the west side of the southeast bay of the lake. The timing of the proposed rehabilitation should avoid any adverse impacts to these birds.

Fish species include eastern brook trout, yellow perch, sunfish, crappie, and bullheads. Competing species have forced the use of catchable planted brooks rather than fry, costing ten times the fry management of the past. There has also been a decline in recreation. Few people fished the lake on opening day, and there has been little or no fishing since.

Sacheen Lake was last rehabilitated in 1979. Department of Wildlife now proposes to treat the lake in September 1989 with 21,000 pounds of dry and 30 gallons of liquid rotenone. This would be applied by tow sacks and spray at a concentration of 1.0 ppm. The lake outlet will be blocked at a barrier dam to protect downstream resources. Replanting is planned for April 1990 with 125,000 fry and 32,000 legal-sized eastern brook trout. Duration of beneficial effects should be five to seven years.

PRE-REHABILITATION FORM

1. Water Sacheen Lk Location 24,25, 26,35, 30 31N 31N 43E 44E (Sec) (Twp) (Rge) (County) Pend Oreill.
 2. Surface Acres 320 Maximum Depth 40 ft Volume (Wt) 334,730,800 cu. 21,422,771,200 l
 3. Date Last Rehabilitation 9/79 Toxicant Used Rotenone
 4. Proposed Treatment Date 9/89 Estimated Replanting Date 04/90 Fry 125.
 Legal 32,000 Species Eastern Brook 5. Proposed Toxicant Rotenone 1,000 lbs dus
 Concentration 1 ppm Amount (roteneone at 5% act. ingred.) 30 gal. liqui
 Method of Application spray liquid Target Species Sunfish, perch, crappie, bul
 Objective: Complete Partial 90%
 6. Procedures for Salvage/Disposal By resident request.
 7. Outlet: Permanent X Intermittent Dry Stream Miles 5 Stream Flow (cfs)
 Measures to Protect Downstream Resources Block creek at barrier dam.
 If None, Why Type Detoxicant If Used
 Duration of Beneficial Effects 5-7 years 8. Does Water Contain Rare, Endangered,
 Endemic Species No. If so, Describe Measure for Protection
 9. Public Access Yes Developed Yes Major Land Ownership (Percent) Public 1% Private 99%
 10. Established Resorts Cedar Creek Resort
 11. Is Water Used for Domestic, Industrial or Irrigation (Registered Water Right) yes
 12. Public Attitude (Pro/Con %) Shoreside Residents 90% Non-Shoreside Residents
 Sports Clubs 100% Public Meeting Not held
 13. Human Uses of Water Fishing, swimming, irrigation
 14. Does Lake Suffer Algae Blooms No Winter Kills No Summer Kills No
 15. Justification for this Rehabilitation Competing species have forced the use of
Catchable planted brooks rather than fry, costing 10 times the fry mar
of the past. Also reduction of recreational mandays costs the local e
and tax revenues. Few people fished the lake on opening day, and no o
fished the lake since then.

Curt Vail
 Curt Vail

Biologist

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 Dat

Region Number One

Physical and Biological Description: Give a complete physical and biological description of the lake and adjacent land area covering the following points:

Fish Species in Water Eastern Brook, yellow perch, sunfish, crappie, bullheads

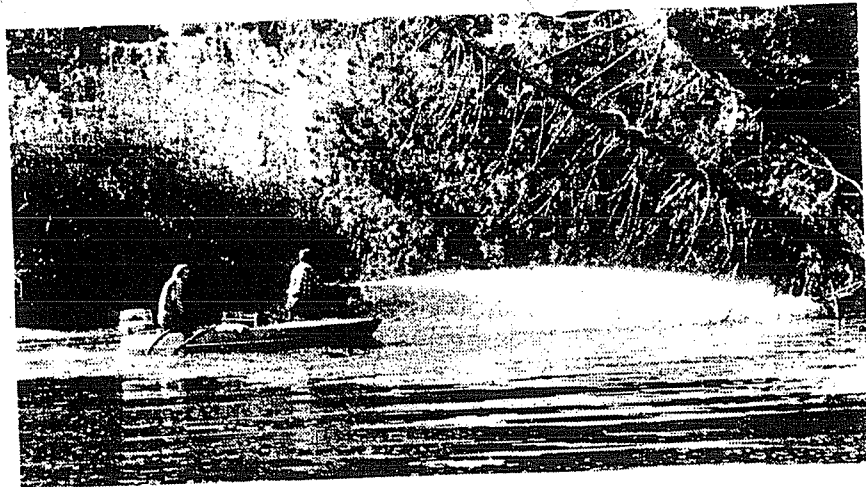
Wildlife Species Using Water Waterfowl, beaver, muskrat, deer, bear, elk, moose.

Wildlife Species in Surrounding Area Same as above

Vegetation Types Surrounding Water Coniferous forest with P. Pine, Western redcedar, and fir. Some willow and alder.

Vegetation Types in Water Water lilly, cattails, sedge, and rooted aquatics.

Land Type and Use of Surrounding Area Residential, and forest/unproductive, with a small amount of agriculture.



LAKE REHABILITATION

The sun's last rays shed just enough light for the frustrated fisherman to load his boat, fishing gear and exhausted son and daughter into the car. It had not been a productive day for the three anglers; small sunfish and perch were the only catch. "I just don't understand it" the father whispered to himself. "Five or six years ago, nice fat trout were easy to catch here. I wonder what has happened?"

Each year, Washington Department of Wildlife (WDW) fisheries biologists and agents encounter similar scenes and confused fishermen. In spite of protective regulations and strong enforcement efforts to protect trout waters from inadvertent or intentional introductions of non-trout species, this scene occasionally takes place. What was once an excellent trout lake is now producing few fish.

WHY

Lakes vary in fertility, and their fertility governs how many pounds of fish they can produce. Those lakes with only trout and those mixed-species lakes with a proper balance of predator and prey species produce the best-quality fishing. But those lakes where the balance is tipped in favor of undesirable fish soon lose their ability to sustain a quality fishing experience.

Pumpkinseed sunfish in the wrong place is a good example of an undesirable fish that can cause extensive damage to trout fishing. They out-compete the trout for food and space, reproduce at an incredible rate and eat small trout fry. The result is a lake filled with lots of little sunfish with minimal fishing value.

Pumpkinseed sunfish and other undesirable species such as carp are introduced into good trout waters in a variety of ways. In some lakes, the fish enter naturally from upstream or downstream. In others, they are introduced by fishermen using live fish for bait (which is why it is illegal to fish with live fish in Washington), and by people who think that they are helping improve the fishing in the lake by giving mother nature a boost by planting their favorite fish.

Lake management is much like good farming. A smart farmer knows which crops will do best in his area, and a good fish biologist knows which fish species will give the best production in a lake. And, just as a farmer tries to eliminate weeds, which are nothing more than undesirable plant species, a fish biologist works to rid lakes of undesirable fish.

LAKE REHABILITATION

DESIRABLE VS UNDESIRABLE FISH

What do fish biologists mean when they say a fish species is "desirable" or "undesirable"? Just as people's tastes in clothing, food and sport change over time, so does the definition of desirable fish species. Generally, an undesirable species is one that is unwanted, like a weed, and therefore unused; or more often, a species that makes it difficult or impossible to produce a healthy population of a more preferred fish. Carp and squawfish are almost always considered undesirable in Washington, as are chubs, tench and excessive populations of shiners, sticklebacks, dace and roach.

Under certain circumstances any fish could be undesirable: an overabundance of stunted brook trout or four-to-five inch adult crappie, or even an adult population of bass that fails to grow to a size that attracts fishermen.

HOW

To return lakes to a high quality, highly productive fishery WDW has a fish management program known as "Lake Rehabilitation." In simplistic terms, a rehabilitated

body of water is one where the existing fish populations are eliminated, and a more desirable population is introduced.

In the early years, lake rehabilitation efforts were aimed solely at maintaining quality trout waters. But in recent years, the tastes of the fishing public have turned toward bass and other sunfish, in addition to trout. Consequently WDW is using rotenone as a tool to improve warm-water fish populations as well.

But the majority of rehabilitations are for trout waters. Fewer than 5% of Washington's lakes are managed as trout-only waters. To maintain a quality trout fishery requires a high survival of planted fingerling-sized trout. Survival of the fingerlings depends upon many things, the most important being the absence of other fish that eat small trout, or compete with them for food and space. It is crucial to keep trout-only waters free of fish such as sunfish, catfish, perch, crappie and bass.

The tool used most frequently to eliminate existing fish populations is rotenone. In the late 1930's fish biologists tested this chemical (found in the roots of a tropical plant, and used for centuries by natives of South America and Asia to catch fish for food) and found it to be a safe, effective and eco-

nomical way to rid a body of water of undesirable fish.

Rotenone works by blocking metabolism at the cellular level. In the concentrations used by fisheries managers (usually one pound per two million pounds of water), it is not harmful to mammals, birds or other animals without gills. No record exists of the chemical ever having caused human illness as a result of its use for rehabilitation. In fact, rotenone is used to cure worms in animals and humans, and is one of the safest and most widely used insecticides in the country.

Rotenone does not harm plants or nearby ecosystems, and it breaks down quickly. It usually dissipates within 30 days, so a lake can be replanted with fish within a short time.

The chemical has some drawbacks. Different species of fish have differing tolerances to it, as do different individuals of the same species. Putting rotenone into a lake does not always kill all the fish in it; it is sometimes ineffective in lakes with large amounts of organic matter and it may fail to reach the deepest parts or areas near springs, marshes, dense weed beds and inlet and outlet streams.

On the average, rehabilitated lakes must be treated with rotenone every eight years to

LAKE REHABILITATION

maintain high production. Incomplete kills and the re-introduction of undesirable fish are the main reasons necessitating continued rehabilitation.

COSTS

Rotenone is relatively inexpensive to use. In 1984, WDW's fish management division spent two percent of its budget for materials for lake rehabilitation. Based on 1984 prices, it cost the department only about \$50 per acre of water treated.

Without chemical treatment, WDW could not furnish the high quality fishing we now enjoy, even if we had unlimited funds. If we tried to maintain this quality of fishing by hatchery production alone, we would have to build far more hatcheries at tremendous cost. This is why:

- Small trout (100-200 fish per pound) planted in trout-only lakes yield returns as high as 80% in some eastern Washington lakes, with 50-60% returns common. Costs: \$.03 per fish produced, \$.06 per fish in the creel.

- Similar plants in western Washington also produce high returns, although the absence of a protective ice covering in the winter increases the losses to birds and other predators.

- Plants of small trout in lakes with established populations of other species are usually much less successful. Not only do these other species prey upon the trout fry, they also compete with them for food.

- Providing trout fishing in mixed-species waters can be done by planting legal-sized trout. Seven-inch trout cost

about 40 cents each to raise, with returns to the fishermen of 30-50%. Costs: \$.80 to \$1.30 per fish in the creel.

(Although survival of trout fry in most mixed-species waters is extremely low, there are some rare exceptions of trout fry survival of up to 25 percent. Conditions leading to this higher rate of survival are not completely understood, but ongoing research studies by WDW biologists may lead to new ways to provide mixed-species lakes with good spiny-ray fishing and cost-effective trout angling as well.)

The chart on the following page shows how much it would cost to manage a lake (in this case, Lake Erie in Skagit County), for the same number of trout available to anglers, with and without rehabilitation. (These figures assume that rehabilitation would be necessary every eight years, which is the statewide average.)

Catch records show that rehabilitated lakes produce over two-and-a-half times as many trout as multiple-species lakes stocked with catchable-sized trout, and that fish planted as fry are usually larger when caught than those planted as catchables. This is because all of the rehabilitated lake's productive capacities are channeled directly into efficient,



LAKE REHABILITATION

well-adapted species that are popular with fishermen. "Trout-only" lakes combine the most economical and the best biological aspects of fisheries management.

WHERE

Are fish biologists "poisoning out all the lakes" as some people fear? There are over 4800 lakes and reservoirs in Washington below 2500 feet in elevation. Since the start of the rehabilitation program, the WDW has treated fewer than 450 of these, with a total of about 33,000 surface acres. Included in this figure are those lakes treated more than once, so the rehabilitation program has touched only a small portion of the state's waters.

The WDW's rehabilitation



MANAGEMENT COSTS FOR MAXIMUM TROUT CATCH

	<u>with rehab</u>	<u>without rehab</u>
		catchables-only fry and catchables
rotenone	\$1200 (2000 lbs.)	0 0
catchable trout	\$10,000 (25,000 fish @ 5/lb) 1st year only	\$80,000 (25,000 fish @ 5/lb) each year \$70,400 (22,500 fish @ 5/lb) each year
fry trout	\$5320 \$665 (50,000 fry @ 150/lb) each year	0 \$5320 \$665 (50,000 fry @ 150/lb) each year
TOTAL	\$16,520	\$80,000 \$75,720

program is one of maintenance, rather than one of expansion. The most adaptable waters have already been treated; and there is little room for expansion of existing hatchery production. The program is intended to keep the existing rehabilitated lakes at maximum production. There are approximately 250 lakes (5%) that are on a regular treatment schedule, with a treatment approximately every eight years.

PUBLIC INPUT

When a lake rehabilitation is considered, WDW takes pains to see that the public is informed and actively solicits comments from interested persons. Environmental impact statements are filed; shoreline residents are told of the proposal and polled for their input; and public hearings are held on controversial rehabs.

The Washington Wildlife Commission has been given specific authority by the legislature to authorize lake rehabilitations. The public involvement process culminates with public testimony at Commission hearings before final decisions are made. The entire process is intended to educate the public about the reasons for lake rehabilitations, and to involve affected citizens in the decision making process.

The Washington Department of Wildlife will provide equal opportunities to all potential and existing employees without regard to race, creed, color, sex, sexual orientation, religion, age, marital status, national origin, disability, or Vietnam Era Veteran's status.

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Appendix C

DISTRIBUTION LIST